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PHYSICIANS' PERCEPTIONS ABOUT THE SHORT-RUN IMPACT OF MEDICARE'S PROSPECTIVE PAYMENT SYSTEM

FINAL REPORT

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MR
JC

1.0 EXECUTIVE SUMMARY

1.1 Overview of Medicare's Prospective Payment System

Congress directed the Secretary of Health and Human Services to develop and put into place by October 1, 1983 a Prospective Payment System (PPS) for inpatient care covered under Medicare. The Medicare PPS replaced traditional retrospective cost-based reimbursement for virtually all inpatient care under Medicare.

Under PPS, hospitals are paid a pre-set price per case based on the diagnosis-related group (DRG) into which the case is classified. The payment is adjusted for urban or rural location, area wage rate, and teaching involvement. A limited number of high cost or long length of stay cases receive "outlier" payments. During the first three fiscal years (1984-1986), the prospective payment is based on a blend of a national rate and a hospital-specific payment, the latter based on historic cost. This blended rate is scheduled to phase into a fully national rate by fiscal 1987 (although Congress is considering an extension of the phase-in period).

Prospective payment on a case-by-case basis changes the incentives that hospitals face. Whereas under cost-based reimbursement, longer stays and more services resulted in higher payments, PPS encourages hospitals to seek ways to reduce costs. When costs are below the PPS payment level the hospital makes a profit on the case; when costs are higher than the payment the hospital takes a loss on the case. PPS is expected to alter hospital practices in any number of ways, as outlined in Table 1-1. Among the more likely occurrences are shortened lengths of stay and reduced ancilliary intensity.

1.2 Motivation

Since the implementation of PPS, HCFA reports that Medicare lengths of stay have declined, and the number of Medicare admissions has decreased. It is presumed from these trends that PPS is working indirectly through hospital administrators to change the way physicians use the hospital as their "workshop" in treating patients. Have administrators in fact encouraged physicians to shorten stays, reduce ancillary use, or shift diagnostic testing to an outpatient basis? Have they encouraged them to

TABLE 1-1

LIKELY EFFECTS OF THE MEDICARE PROSPECTIVE PAYMENT SYSTEM

- Reduce services per patient and phase out unprofitable services
- Shorten inpatient length of stay and increase use of home health care, nursing homes ("discharge quicker and sicker" phenomenon)
- Increase admissions and readmissions, perhaps shifting some care from outpatient to inpatient settings in response to decreased occupancy rates
- Increase preadmission testing on outpatient basis, billing Part B for laboratory testing and collecting full DRG payment under Part A
- Legitimately recode some diagnoses to higher cost DRGs; alter treatment modality to obtain higher payment level
- "Skim" patients within selected DRGs; transfer sicker patients elsewhere
- Phase out cross-subsidized services, such as nutritional counseling, social services
- Restructure hospital sector through horizontal integration into chains and vertical integration linking hospitals, nursing homes, and ambulatory care centers

Adapted from: Judith R. Lave, "Hospital Payment under Medicare," Proceedings of the Conference on the Future of Medicare, February 1, 1984. U.S. Congress, House Committee on Ways and Means, Subcommittee on Health. (Washington, D.C.: U.S. Government Printing Office, 1984).

admit more Medicare patients to increase reimbursements, or to target admissions on "profitable" diagnosis-related groups (DRGs)?

In anticipation of these questions, a few items were included in the Physicians' Practice Costs and Income Survey (PPCIS) to gather physicians' impressions of recent changes in their inpatient activity. The PPCIS surveyed all physicians who had a hospital affiliation for at least one year regarding changes brought about by PPS and other hospital cost control efforts. Secondary data on hospital characteristics were linked to the PPCIS, providing a unique and rich database with which to analyze physicians' perceptions of hospital incentives and pressures.

This study does not seek to place a value judgment on the behavioral changes, but merely identifies physician perceptions about how their behaviors might change.

1.3 Overview of Findings

This study examines the short-run impact of Medicare's Prospective Payment System, as perceived by a national sample of physicians. The Physicians' Practice Costs and Income Survey asked over 4,000 physicians nationwide whether they were encouraged to change certain aspects of their inpatient activity. The results suggest that Medicare's PPS has had a widespread impact on physicians' inpatient activity.

- 89 percent of radiologists, anesthesiologists and pathologists (RAPs) were encouraged to change one or more aspects of their inpatient activity in the previous year.
- 83 percent of non-RAPs (all other specialties) were encouraged to change their inpatient behavior in one or more ways.

The most common impacts reported by physicians were pressures to discharge patients sooner and to shift testing to outpatient settings. (See Table 1-2.)

- Overall, 78 percent of the non-RAPs were urged to shorten lengths of stay. Four-fifths of these physicians attributed the pressure to PPS, indicating that 64 percent of all non-RAPs nationwide were urged to discharge sooner due to PPS.
- Among RAPs, 85 percent were encouraged to shift testing to outpatient settings, and most attributed the shift to PPS. This suggests that 73 percent of all RAPs in the nation were encouraged to do outpatient testing as a result of PPS.

TABLE 1-2

OVERVIEW OF PPS IMPACTS[a,b]

PPS Impact	Percent reporting impact	Of those reporting *any* change, percent citing PPS as reasons	Percent of all physicians who cited PPS as reason for change (col. 1 x col. 2)
Non-RAPs (Percent citing PPS as reason for one or more changes)	83.1%	79.4%	66.0%
Increase the number of patients admitted	21.3	79.6	17.0
Admit fewer Medicare patients	12.9	89.2	11.5
Admit more Medicare patients	3.4	83.0	2.8
Admit more patients with certain diagnoses	4.5	83.0	3.7
Reduce the number of lab tests or x-rays usually ordered for inpatients	45.1	84.8	38.2
Discharge patients sooner	77.9	82.1	64.0
RAPs (Percent citing PPS as reason for one or more changes)	88.8%	84.2%	74.4%
Try to cut department costs by conducting fewer procedures	56.2	87.0	48.9
Limit the use of expensive diagnostic testing	62.3	87.0	54.2
Do testing on outpatient basis	85.3	85.8	73.1

[a] Specifically, physicians were asked, "Since this time last year, have the physicians in your hospital been encouraged to...."

[b] This table includes only physicians who (a) had hospital admitting privileges or regularly treated hospitalized patients admitted by other physicians, and (b) who had been affiliated with a hospital for at least one year.

NOTE: The figures in this table have been weighted to provide national estimates.

SOURCE: 1984-85 Physicians' Practice Costs and Income Survey.

Physicians were also frequently encouraged to reduce ancillaries in an effort to reduce the cost per inpatient stay.

- 62 percent of the RAPs were urged to limit the use of expensive diagnostic testing.
- 56 percent of the RAPs were asked to cut department costs by conducting fewer procedures.
- 45 percent of the non-RAPs were pressured to reduce the number of tests or x-rays they ordered.

Medicare's PPS had much less of an impact on patient mix in terms of payer status, quantity and casemix.

- 21 percent were encouraged to increase admissions.
- 5 percent were encouraged to admit more patients with certain diagnoses.

For Medicare more specifically, the trend was for fewer admissions.

- 13 percent were encouraged to admit fewer Medicare patients.
- 3 percent were encouraged to admit more Medicare patients.

The PPS impacts were reported across all specialties at roughly the same rates, with two exceptions. Pediatricians and psychiatrists were less likely to be pressured to discharge sooner or to reduce tests or x-rays. Psychiatrists, in fact, were more likely to feel pressure to increase admissions. These two specialties tend to have low Medicare caseloads and to be affiliated with hospitals that are exempt from PPS so differential impacts were not surprising.

We examined selected aspects of physicians' hospital involvement to determine whether hospital administrators "targetted" any groups to modify their inpatient behavior because of PPS. We found that physicians who were paid by hospitals on a fee-for-service basis, who received a fixed percentage of charges, or who had admitting privileges only were more likely than salaried physicians to be urged to discharge sooner.

- 81 percent of physicians paid on a fee-for-service or percentage basis and 79 percent of those with admitting privileges were urged to discharge sooner, compared to 72 percent of those on straight salary.

Physicians with higher Medicare caseloads were more often urged to discharge sooner than those with small Medicare caseloads. Additionally, physicians with greater dependence on hospital revenues were more often encouraged to discharge sooner than those with less dependence.

- 71 percent of those with small Medicare caseloads (less than 10 percent) were urged to discharge sooner compared to 82-83 percent of those with larger Medicare caseloads (10 percent or more).
- About 78-81 percent of those receiving more than 10 percent of their revenue from hospital patients were encouraged to discharge sooner, while 71 percent of those with less reliance on hospital revenues were encouraged to do so.

We expected the hospital's location to be associated with short-run responses to PPS, given the wide regional variations in length of stay and average cost per admission. We found no urban/rural differences and only minor variations across regions. (See Table 1-3.)

- Almost identical percentages of physicians were encouraged to discharge sooner in urban (79 percent) and rural areas (80 percent).
- Only 71 percent of physicians in the West South Central region were encouraged to discharge sooner, while 86 percent in Middle Atlantic states were encouraged to do so. This emphasis is undoubtedly related to pre-PPS regional variations in average length of stay which are far longer in the East.

Other hospital characteristics were examined, such as hospital ownership, date the hospital came onto PPS, teaching status, bedsize, occupancy, length of stay, Medicare dependency, average cost, and local hospital competition. The most striking result was that, for the most part, physicians reporting that they had been encouraged to change their inpatient activity were not all that different from those not reporting such encouragement. One can envision a scenario where most hospitals contacted physicians to inform them of the incentives under the new Medicare payment system. The contact could be as minimal as a letter specifying the new payment terms and the hospital's financial position. At the other extreme, administrators might single out individual physicians with unusually long stays or a propensity to order unnecessary tests. Either way, respondents

TABLE 1-3

HOSPITAL LOCATION AND PPS IMPACTS

	Percent of physicians encouraged to:		
	Discharge sooner	Reduce tests/ x-rays	Increase number of patients admitted
NON-RAPs			
Location			
Urban	79%	45%	22%
Rural	80	44	19
Region			
New England	84	51	17
Middle Atlantic	86	46	27
South Atlantic	77	45	19
East South Central	77	41	15
West South Central	71	43	20
East North Central	82	44	22
West North Central	75	43	19
Mountain	81	48	29
Pacific	75	43	20

	Percent of physicians encouraged to:		
	Conduct fewer procedures	Reduce costly diagnostic testing	Test on outpatient basis
RAPs			
Location			
Urban	56%	62%	85%
Rural	62	69	84
Region			
Northeast	53	61	83
South	57	62	84
North Central	58	62	88
West	57	68	84

NOTE: The figures in this table have been weighted to provide national estimates.

SOURCES: 1984-85 Physicians' Practice Costs and Income Survey; CHER Hospital Data Tape.

would have reported to us that physicians in their hospitals were encouraged to change their inpatient activity, regardless of how indirect or minimal the encouragement was.

It is reasonable to assume that some form of contact was initiated by most hospitals, without regard to their ownership, location, and teaching involvement (among other factors). Most hospital administrators recognized from the beginning that any cost control strategies would reduce their losses or boost their gains under PPS. Thus, both low cost and high cost hospitals had incentives to encourage efficiency.

1.4 Limitations

The analyses presented in this report employ descriptive statistical methods. Because this analysis is limited to 2-way and 3-way cross-tabulations, the observed relationships should be interpreted with caution since an underlying variable may account for the relationship. Multivariate analytic techniques (such as multiple regression) are required to control for the independent effects of each variable and will be the subject of future analysis.

Another caveat concerns the interpretation of PPS impacts. While the PPCIS asked respondents whether the physicians in their hospital had been encouraged to make specific changes in their hospital practice, not all changes are attributed solely to PPS. Some physicians also reported pressures from Peer Review Organizations (PROs) and Health Maintenance Organizations (HMOs). Furthermore, some physicians reported that such changes were anticipated but had not yet occurred. Finally, while physicians could have been encouraged to discharge sooner, for example, they may not have altered their practices. (See Section 2.5 for further discussion of these limitations.) In spite of these limitations, this report provides a barometer of the respondents' impressions of how hospital management may have attempted to influence physicican behavior in the short-run as a result of PPS.

1.5 Organization of the Report

The data source for this analysis is the 1984-85 Physicians' Practice Costs and Income Survey, conducted by NORC, and described in Chapter 2. Chapter 3 presents an overview of PPS incentives as reported by physicians.

Chapter 4 examines the physician characteristics associated with changes in inpatient activity, such as reliance on hospital revenues, extent of Medicare patient load, and hospital financial arrangements. Chapter 5 focuses on characteristics of the hospitals with which the physicians are primarily affiliated, such as hospital ownership and control, teaching status, average cost and length of stay, bed size, and hospital location.

2.0 DESCRIPTION OF THE PHYSICIANS' PRACTICE COSTS AND INCOME SURVEY

2.1 Overview

Between October 1984 and June 1985, NORC (National Opinion Research Center) conducted a detailed national survey of physicians. The Physicians' Practice Costs and Income Survey (PPCIS) was supported under a contract with the Health Care Financing Administration (HCFA). Health Economics Research, Inc. (HER) serves as a subcontractor for the data analysis.

The survey has ten main objectives:

1. Medicare Economic Index (MEI) update
2. Financial arrangements in the physician's practice
3. Physician participation in public programs
4. Physician fees and third-party payments
5. Insurance coverage of physician's patients
6. Medicare out-of-pocket collections and bad debts
7. Physician productivity and setting of care
8. Physician-hospital relationships (including effect of DRGs)
9. Physician characteristics
10. Patient characteristics.

The PPCIS was chosen as the database for this analysis because all physicians with a hospital affiliation for at least one year were asked about recent changes in their inpatient activity. Additionally, they were asked whether such changes could be attributed to Medicare's PPS. Secondary data on characteristics of the hospitals with which the physicians were primarily affiliated were linked to the PPCIS. The combination of primary data from the physicians and secondary hospital-level data provides a unique and rich database to analyze physicians' perceptions of hospital incentives in this era of prospective payment and other cost control pressures within hospitals.

2.2 Sample Design

2.2.1 Sampling Frame

The sampling frame for the Physicians' Practice Costs and Income Survey was the list of 331,264 physicians contained in the 1984 Physician Master File and maintained by the American Medical Association. (The sampling frame is a listing from which the sample is to be selected and should

include virtually all members of the target population.) In contrast to previous years, physicians in office-based and hospital-based practices are included, as well as physicians in large group practices (more than nine physicians), and in alternative practice modes such as HMOs, PPOs, and IPAs.

The target population of the PPCIS includes physicians meeting the following criteria:

- in active practice at the time of interview, providing patient care at least 20 hours per week in an office-based or hospital-based setting (excluding residents, full-time faculty members, and research fellows);
- engaged in patient care during some part of calendar year 1983;
- not employed by the Federal Government;
- practicing in the 50 United States and the District of Columbia (but excluding the U.S. territories); and
- belonging to a recognized medical specialty, excluding osteopaths, chiropractors, dentists, and limited license physicians.

The sample of physicians included in the PPCIS should be representative of the physicians affected by PPS. The exclusion of physicians employed by the Federal Government is comparable to the exclusion of Federal hospitals from PPS. The one difference is the exclusion from PPCIS of physicians spending less than 20 hours per week in patient-care activity. However, the exclusion of these physicians is not expected to bias the results presented in this report.

NORC used a single stage, stratified element level, random sampling design based on 136 discrete strata that were defined in three basic dimensions: Specialty Group, Geographic Region, and Degree of Urbanization. The categories in each dimension are listed in Table 2-1. The sample allocation among the strata was proportional to the distribution in the population except for low incidence specialties. Four office-based specialties were oversampled to achieve a minimum of 200 sample cases (cardiology, orthopedic surgery, ophthalmology, urology), while three hospital-based specialties were oversampled to obtain a minimum sample size of 300 cases (radiology, anesthesiology, and pathology).

TABLE 2-1

DIMENSIONS OF 136 STRATA: PHYSICIANS' PRACTICE COSTS AND INCOME SURVEY

Dimension I -- Specialty Group (17)

General Practice
Family Practice
Internal Medicine
Cardiology
Pediatrics
Other Medical Specialties
General Surgery
Orthopedic Surgery
Ophthalmology
Urology
Obstetrics/Gynecology
Other Surgical Specialties
Psychiatry
Anesthesiology
Pathology
Radiology
All Other Specialties

Dimension II -- Census Region* (4)

Northeast
North Central
South
West

Dimension III -- Degree of Urbanization (2)

Metropolitan Statistical Areas
Outside Metropolitan Statistical Areas

Total Number of Strata = 136 [17 x 4 x 2]

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*Refer to Appendix A for definition of regions.

The next two sections discuss the survey response rate (according to the three dimensions), and the sample weights (used to derive national estimates).

2.2.2 Survey Response Rate

Of the 8,947 cases for which eligibility was determined, 2,100 (23 percent) were found to be ineligible (see Table 2-2). A case was considered ineligible if it met one or more of the following criteria: (1) did not provide patient care at least 20 hours per week at the time of interview; (2) did not, in any part of 1983, engage in patient care for at least 20 hours per week; (3) was a resident or research fellow at a medical school; (4) was employed by the Federal Government; (5) was employed by state/local government in a non-patient care capacity; (6) lived outside the 50 United States or the District of Columbia; (7) was a full-time faculty member, unless providing at least 20 hours of patient care per week; or (8) the whereabouts could not be located.

Overall, a weighted completion rate of 67.6 percent was obtained. (Completion rates were adjusted to account for cases in which eligibility was not determined.) A case was considered "complete" if a core set of questions was answered. At a minimum, the respondent was required to answer selected questions related to: eligibility and practice arrangements, Medicare participation agreements, hospital affiliation, prospective payment system impacts, financial arrangements with hospitals, insurance status of patients and bad debts, malpractice payments and practice income, alternative health plan arrangements, and productivity.

There was a wide range in completion rates by specialty, with a high of 77 percent among anesthesiologists and a low of 53 percent among cardiologists (Table 2-2). The response rate by region ranged from 64.7 percent in the West to 69.8 percent in the North Central region. Among physicians in rural (non-MSA) areas, the response rate was 71.8 percent, compared to 66.8 percent of those in urban areas.

2.2.3 Sample Weights

Unless otherwise indicated, the data presented in the text and tables are weighted to provide national estimates. The weights reflect the disproportionate probability of selection across the 136 strata. (See

TABLE 2-2

RESPONSE TO 1984-1985 PHYSICIANS' PRACTICE COSTS AND INCOME SURVEY BY SPECIALTY, CENSUS REGION, AND DEGREE OF URBANIZATION

Dimension	Number of cases with eligibility determined*	Ineligible Cases		Completed Cases	
		Number	Percent of cases ineligible**	Number	Weighted Completion Rate***
Total	8,947	2,100	23.5%	4,729	67.7%
Specialty					
General Practice	663	192	29.0	315	64.8
Family Practice	574	91	15.9	351	72.2
Internal Medicine	948	230	24.3	455	62.5
Cardiology	379	72	19.0	167	53.1
Pediatrics	597	164	27.5	300	68.0
Other Medical	517	92	17.8	284	65.9
General Surgery	484	106	21.9	271	70.8
Orthopedic Surgery	308	44	14.3	154	56.2
Ophthalmology	315	58	18.4	160	61.1
Urology	340	61	17.9	187	65.9
Obstetrics/Gynecology	490	81	16.5	281	66.1
Other Surgical	345	69	20.0	188	66.8
Psychiatry	573	156	27.2	321	74.4
Anesthesiology	569	146	25.7	330	76.7
Pathology	618	191	30.9	321	74.9
Radiology	594	144	24.2	327	72.1
All Other Specialties	633	203	32.1	317	70.9
Census Region					
North East	2,255	626	27.8	1,139	69.9
North Central	2,002	465	23.2	1,090	70.9
South	2,719	575	21.1	1,480	69.0
West	1,971	434	22.0	1,020	66.4
Degree of Urbanization					
Metropolitan Statistical Areas	7,556	1,872	24.8	3,873	66.8
Outside Metropolitan Statistical Areas	1,391	228	16.4	856	72.0

*A total of 9,130 cases were fielded.

**Percent of cases ineligible = number of ineligible cases/number of cases with eligibility determined.

***These rates reflect an adjustment for cases of indeterminate eligibility (data not shown). Cases with indeterminate eligibility were assigned to the "eligible" or "ineligible" categories, based on the proportions for the cases for which eligibility was determined.

Section 2.2.1.) Within the 136 strata, all physicians have the same probability of selection into the sample. The weights also take into account nonresponse within each stratum.

The weight for each stratum is derived as follows:

$$W_j = (N/D)_j*(C/A)_j$$

where W_j = sample weight in the jth stratum;
N_j = sampling frame size (i.e., size of the target population);
A_j = contacted cases for which eligibility was determined;
C_j = cases eligible for interview;
D_j = completed cases.

The sampling frame size (N_j) corresponds to the number of physicians in the jth stratum, as measured by the 1984 AMA Physician Master File. (The frame size was calculated for each of the 136 strata.) The number of cases eligible for interview (C_j) is a subset of the number of cases for which eligibility was determined (A_j). The ratio, $(C/A)_j$ is the percent of contacted cases that were eligible for the survey (based on the eligibility criteria discussed in Sections 2.2.1 and 2.2.2). The denominator (D_j) represents the number of completed cases in each stratum.

Consider, for example, the weight for general practice physicians in urban areas, in the Northeast. The AMA Master File identifies 675 such physicians, of which 20 were selected into the PPCIS sample. Eligibility was determined for 17, and 16 of the 17 were deemed eligible. Altogether, 13 of the 16 eligibles participated in the PPCIS. Based on this example: $N = 675$, $A = 17$, $C = 16$, and $D = 13$. Thus, the weight for this stratum would be: $W = (675/13)*(16/17) = (51.9)(.94) = 48.9$. Each of the 13 physicians interviewed represented 51.9 physicians in the stratum, with a minor downward adjustment (6 percent) for ineligibles in the stratum, yielding an adjusted weight of 48.9.

The weight (W_j) reflects the extent physicians in a particular stratum will be emphasized in generating the national estimates. For the purpose of this report, computations were based on a rounded weight to accommodate restrictions of the SAS procedures used to generate the statistics. Thus, based on the above example, each general practice physician in an urban area in the Northeast has a weight of 49, in calculations based on weighted data.

2.3 Relevant Questionnaire Items

Questions 40 and 41 of the PPCIS instrument queried physicians on recent changes in their inpatient activity and the impact of PPS. Question 40 was divided into two paths: Q40A through Q40F were asked of all physician specialties except the three hospital-based specialties, while Q40G to Q40I were designed specifically for radiologists, anesthesiologists, and pathologists (RAPs). Data for these two specialty groups--RAPs and non-RAPs--are presented separately in Sections 3, 4, and 5.

The wording of the questions related to changes in inpatient activity and the impact of PPS was as follows:

Q40. Since this time last year, have the physicians in your hospital been encouraged to...

NON-RAPs ONLY:	YES	NO
A. Increase the number of patients they admit?....	1	2
B. Admit fewer Medicare patients?................	1	2
C. Admit more Medicare patients?.................	1	2
D. Admit more patients with certain kinds of diagnoses?..................................	1	2
E. Reduce the number of lab tests or x-rays you usually order for inpatients?.......	1	2
F. Discharge patients sooner?....................	1	2

RAPs ONLY:	YES	NO
G. Try to cut department costs by conducting fewer procedures?...........................	1	2
H. Limit the use of expensive diagnostic testing?.	1	2
I. Do testing on an outpatient basis?............	1	2

IF ANY "YES" IN Q.40:

Q41. Was Medicare's new DRG Prospective Payment System a reason for any of the changes you mentioned?

YES 1
NO 2

2.4 Scope of the Sample

Questions 40 and 41 were asked of a selected subsample of respondents. This, in effect, limits the generalizability of the results in this report to a subpopulation of all physicians. Question 40 was asked of all physicians who (a) had admitting privileges to one or more hospitals or

regularly treated hospitalized patients admitted by other physicians, and (b) who had been affiliated with a hospital for at least one year. The eligibility path is shown schematically in Figure 2-1.

Table 2-3 shows the net effect of these eligibility criteria on the sample size. Of the 4,729 physicians participating in the survey, 4,494 had a hospital affiliation, i.e., admitting privileges or regularly treating hospitalized patients admitted by other physicians. Of this number, 4,300 were affiliated with a hospital for at least one year. These 4,300 physicians form the subsample for analysis.

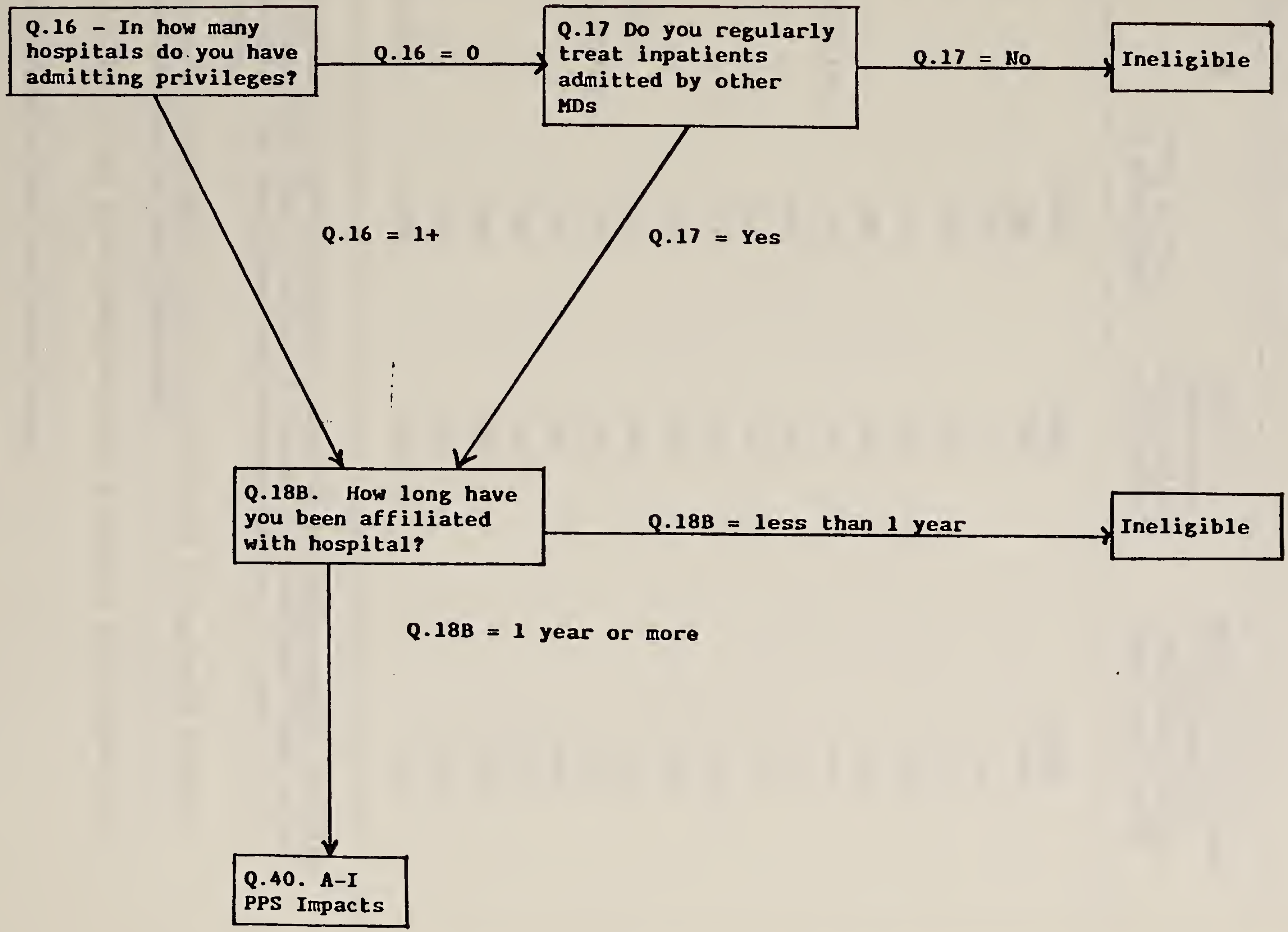
2.5 Limitations of this Analysis for Assessing Short-run PPS Effects

Responses to Question 41 may understate or overstate the nature and magnitude of short-run PPS effects. Unfortunately, the direction of the bias is unknown. Question 41 was asked of any physician responding affirmatively to at least one of the questions in Q.40. However, Q.41 may not include all physicians who were encouraged to change their inpatient activity due to PPS or some other cost control program. For example, some surgeons may have been encouraged primarily to perform surgery on an outpatient basis. Because this incentive was not included in the list of possible impacts, such a physician would not have been asked Q.41 (unless another change in Q.40 was reported).

Another factor that may result in understating short-run PPS effects is the time dimension. Hospitals came onto PPS at the beginning of their fiscal year following September 30, 1983. More than half came onto PPS following June 30, 1984. Physician interviews were conducted from October 1984 through June 1985. The time dimension might work as follows: Physician A, affiliated with a hospital that came onto PPS in October 1983, was interviewed in June 1985; Physician B was interviewed in November 1984, and was affiliated with a hospital coming onto PPS in July 1984. These two extreme examples reflect the potential variation in "exposure" to PPS: Physician A had about 15 months, while Physician B had only 4 months.

On the other hand, the responses to Q.41 may overstate the effect of PPS. A single question asked whether any of the changes that were mentioned resulted from PPS. In cases where multiple changes were reported, one could be attributable to PPS and the others to "something else". Furthermore, even where all of the reported changes were brought about by PPS, other concurrent forces could have been involved.

FIGURE 2-1. DIAGRAM OF ELIGIBILITY FOR Q.40: "SINCE THIS TIME LAST YEAR, HAVE THE PHYSICIANS IN YOUR HOSPITAL BEEN ENCOURAGED TO...?"


Q.16 - In how many hospitals do you have admitting privileges?
Q.16 = 0
Q.17 Do you regularly treat inpatients admitted by other MDs
Q.17 = No
Ineligible
Q.16 = 1+
Q.17 = Yes
Q.18B. How long have you been affiliated with hospital?
Q.18B = less than 1 year
Ineligible
Q.18B = 1 year or more
Q.40. A-I PPS Impacts

[illegible]

TABLE 2-3

SCOPE OF THE SAMPLE INCLUDED IN THIS REPORT

Specialty	Total number of physicians*	Number of physicians with hospital affiliation**	Number of physicians with hospital affiliation for at least one year***
Total	4,729	4,494	4,300
General practice	233	207	201
Family practice	466	443	426
Internal medicine	472	452	431
Cardiology	157	156	154
Pediatrics	303	296	282
Other medical specialties	269	263	249
General surgery	262	261	257
Orthopedic surgery	162	160	154
Ophthalmology	163	161	152
Urology	185	185	179
Obstetrics/Gynecology	287	286	272
Other surgical specialties	195	193	185
Psychiatry	318	267	245
Anesthesiology	328	328	315
Pathology	316	300	284
Radiology	326	290	286
All other specialties	287	246	228

*The number of physicians in each specialty is based on the self-reported specialty. These totals will differ from those in Table 2-2 (column 4), which were based on data from the AMA Master File. The physicians' self-reported specialty is used for all analyses in this report.

**Includes physicians who had hospital admitting privileges or regularly treated hospitalized patients admitted by other physicians.

***This report is limited to the 4,300 physicians with a hospital affiliation for at least one year.

SOURCE: Physicians' Practice Costs and Income Survey.

The interpretation of Q.41 is further complicated by the wording of Q.40. Respondents were asked, "... have the physicians in your hospital been encouraged to...discharge patients sooner?". An affirmative response, however, does not necessarily indicate that the physicians actually began discharging sooner. It may suggest simply that hospital administrators were placing such pressures on physicians, which some physicians said they ultimately ignored.

2.6 Sources of Secondary Data

2.6.1 Overview of Data Sources

Four data bases provided the secondary data used in this report. (See Table 2-4.) The Area Resource File (ARF), a unique resource for health-related research, provided county-level data on the supply of hospital beds and the census population. A measure of hospital beds per population was derived. Assembled by Applied Management Sciences under contract to the Health Resources and Services Administration, the ARF itself is a secondary data base containing information from the American Medical Association, American Hospital Association, and Bureau of the Census, among others. The May 1984 version was linked to the PPCIS.

The majority of the hospital-level data was obtained from the expanded file of the 1982 Survey of Hospitals, conducted by the American Hospital Association. Basic data on ownership and control, bed size, admissions and days (total and Medicare), occupancy, and teaching status were obtained from this source. Two additional sources provided hospital-level data. The CHER Hospital Data Tape contains data elements from the 1982 AHA tape, as well as data from the 1982 HCFA Wage Index Survey and from 1981 Medicare Cost Reports. This tape was the source of data on the cost per Medicare admission, the date hospitals came onto Medicare's prospective payment system (PPS), Medicare days and costs, and useful recodes on hospital location (e.g., region and urban/rural location). Selected items from the AHA and CHER data tapes were merged onto a single tape by Health Economics Research, and supplied to NORC.

The final data source was a public use tape provided by HCFA on the number of interns and residents per 100 beds for 1984. This tape was released by HCFA in July 1984 and was obtained by special arrangement for this contract through the HCFA Project Officer.

TABLE 2-4

LIST OF SECONDARY DATA USED IN THIS REPORT

Data Source	Sponsor	Unit	List of data elements
Area Resource File (May 1984)	Office of Data Analysis and Management, Health Resources and Services Administration, DHHS	county-level	• hospital beds • Census population
AHA Annual Survey of Hospitals (1982)	American Hospital Association (AHA)	hospital-level	• hospital ownership and management • medical school affiliation • JCAH accreditation • COTH membership • bed size • total admissions and days • Medicare admissions and days • Medicare length of stay • occupancy rate • average daily census
CHER Hospital Data Tape (various years)	Center for Health Economics Research (CHER)	hospital-level	• hospital location (urban, rural; region) • date hospital came onto PPS • cost per Medicare admission • cost per Medicare day
HCFA's Interns and Residents (1984)	Health Care Financing Administration (HCFA), DHHS	hospital-level	• interns and residents per 100 hospital beds

2.6.2 Technical Issues in Merging Secondary Data

The merger of secondary data to the PPCIS analytic file was no small task. The first linkage was between the Area Resource File and the analytic file. NORC obtained access to the Area Resource File through the Center for Health Administration Studies, University of Chicago. The identifier used to link the two files was the five-digit state and county FIPS code. The FIPS code came from the AMA Physician Master File for most cases. However, those physicians who had relocated required manual coding, with a FIPS code reflecting their new address. The merge between ARF and PPCIS successfully attached county-level data to every record in the PPCIS.

The next merger, between the AHA/CHER tape and the PPCIS was somewhat more complicated. Respondents were asked to give the name and address of the hospital with which they were primarily affiliated, if any. The coders looked up the hospital's name and address in an AHA directory to find the AHA hospital code (a six-digit identifier). The name and/or address reported by the physician frequently differed from the directory, thus complicating the task and demanding judgment by the coding supervisor. These codes were merged onto the PPCIS analytic file and then the merger was made between the AHA/CHER tape and the PPCIS analytic file.

The final merger was between the HCFA Interns and Residents Tape and the PPCIS analytic file. This required an intermediate step of linking the AHA codes with a crosswalk to the Medicare Provider Codes (MPC). Additionally some hand-coding of MPCs was required.

Not all cases were coded with an AHA code or MPC. In 189 cases, the physician did not have a primary hospital affiliation. In about 50 other cases the physician refused to provide the hospital's name and address, precluding any coding of hospital identifiers. There were 16 cases for which a hospital was given, but an MPC and/or AHA code could not be found.

3.0 OVERVIEW OF PPS IMPACTS

3.1 Introduction

Physicians with a hospital affiliation for one year or more were queried about two generic types of changes in their inpatient activity: (1) those related to service mix, quantity, and locus; and (2) those affecting patient payer mix, quantity, and casemix. The PPS impacts listed in Table 3-1 are divided along the two dimensions as follows:

Patient mix impact
- Increase the number of patients admitted
- Admit fewer Medicare patients
- Admit more Medicare patients
- Admit more patients with certain diagnoses

Service mix impact
- Reduce the number of lab tests or x-rays usually ordered (non-RAPs)
- Discharge patients sooner
- Try to cut department costs by conducting fewer procedures (RAPs)
- Limit the use of expensive diagnostic testing
- Do testing on outpatient basis.

3.2 National PPS Impacts

As Table 3-1 shows, non-RAPs (that is, all specialties except radiology, anesthesiology, and pathology) most frequently reported changes in service mix rather than patient mix. (The RAPs were only queried about changes in service mix, because they generally do not admit patients.) For example, 78 percent of the non-RAPs (col. 1) reported that physicians in their hospital had been encouraged to discharge patients sooner. Among the RAPs, 85 percent reported being encouraged to do testing on an outpatient basis. The net effect of both of these impacts may be to shift the locus of care from inpatient settings to outpatient facilities, other institutions, or the patient's home, as well as to reduce the cost of the given inpatient episode (although not necessarily the total cost of treatment, including outpatient and other settings).

Another area where cost control pressures (from PPS and other mechanisms) had a strong perceived impact was in reducing diagnostic tests and other procedures (e.g., laboratory tests, x-rays). For example, 45 percent of the non-RAPs reported they were encouraged to reduce the number

TABLE 3-1

OVERVIEW OF PPS IMPACTS[a]

PPS Impact	All physicians[b] Percent reporting impact	All physicians[b] Of those reporting any change, percent citing PPS as reason	All physicians[b] Percent of all physicians who cited PPS as reason for change	Physicians in non-waivered states Percent reporting impact	Physicians in non-waivered states Of those reporting any change, percent citing PPS as reason	Physicians in non-waivered states Percent of all physicians who cited PPS as reason for change	Physicians in waivered states Percent reporting impact	Physicians in waivered states Of those reporting any change, percent citing PPS as reason	Physicians in waivered states Percent of all physicians who cited PPS as reason for change
Non-RAPs	83.1%	79.4%	66.0%	82.7%	85.1%	70.4%	86.8%	61.9%	53.8%
Increase the number of patients admitted	21.3	79.6	17.0	20.0	84.9	17.0	25.1	66.2	16.6
Admit fewer Medicare patients	12.9	89.2	11.5	13.3	90.6	12.0	10.9	76.4	8.3
Admit more Medicare patients	3.4	83.0	2.8	3.0	89.1	2.7	3.3	70.6	2.3
Admit more patients with certain diagnoses	4.5	83.0	3.7	3.8	93.0	3.5	5.6	67.0	3.7
Reduce the number of lab tests or x-rays usually ordered for inpatients	45.1	84.8	38.2	44.9	89.2	40.1	45.6	68.1	31.1
Discharge patients sooner	77.9	82.1	64.0	77.8	87.5	68.1	83.0	63.5	52.7
RAPs	88.8%	84.2%	74.7%	89.5%	90.0%	80.2%	84.0%	53.8%	45.1%
Try to cut department costs by conducting fewer procedures	56.2	87.0	48.9	58.2	92.5	53.8	49.4	53.7	26.5
Limit the use of expensive diagnostic testing	62.3	87.0	54.2	64.2	91.7	58.9	57.1	55.2	31.5
Do testing on outpatient basis	85.3	85.8	73.1	85.7	91.1	78.1	80.1	56.9	45.6

[a] Specifically, physicians were asked, "Since this time last year, have the physicians in your hospital been encouraged to...."

[b] This table includes only physicians who (a) had hospital admitting privileges or regularly treated hospitalized patients admitted by other physicians, and (b) who had been affiliated with a hospital for at least one year.

NOTE: The figures in this table have been weighted to provide national estimates.

SOURCE: Physicians' Practice Costs and Income Survey.

of lab tests or x-rays usually ordered for inpatients. Similarly, 62 percent of the RAPs reported they were encouraged to limit the use of expensive diagnostic testing, while 56 percent reported they were encouraged to conduct fewer procedures in an effort to cut department costs.

A relatively small impact on patient mix and quantity (i.e., diagnostic or payer mix or number of admissions) was reported by physicians. Only 21 percent of the non-RAPs reported they were encouraged to increase the number of patients admitted. Physicians were encouraged even less frequently to admit fewer Medicare patients (13 percent), admit more Medicare patients (3 percent), or admit more patients with certain diagnoses (5 percent).

Table 3-1 (col. 2) also shows the extent to which these changes in inpatient activity were attributable by the physician to the Prospective Payment System. Of the non-RAPs reporting they were encouraged to discharge sooner, about four-fifths (82 percent) attributed such an impact to PPS. Overall, 64 percent of non-RAPs in the nation were encouraged to discharge sooner as a result of PPS (col. 3). Of the RAPs who were encouraged to do testing on an outpatient basis, 86 percent cited PPS as a reason for the change. Medicare's PPS affected 73 percent of all RAPs in this way.

One caveat mentioned in Chapter 2 (Section 2.5) should be recalled here. The net effect of PPS may be overstated in columns 2 and 3 given the wording of the question on PPS impacts. A single question asked whether any of the changes that were mentioned resulted from PPS. In cases where multiple changes were reported, one could be attributable to PPS and the others to "something else". Furthermore, even where all of the reported changes were brought about by PPS, other concurrent forces could have been involved.

An analysis of physicians' unsolicited remarks concerning the impact of PPS is revealing. During the interview, the interviewers were instructed to record respondents' remarks. This qualitative information is anecdotal and not necessarily representative; however, it places into perspective the perceived impact of PPS on physicians' inpatient activity.*

Many physicians had no doubt that PPS was responsible for changes in their practice patterns. They responded: "of course," "absolutely, yes,

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*Approximately 100 of the 4,300 physicians with a hospital affiliation for at least one year provided unsolicited comments related to Q.41. Unfortunately, these remarks cannot be quantitatively analyzed due to the small number of responses.

the whole reason," "100%," "certainly," "and it's a disaster," "very much so," and so on. One physician remarked, "There is no doubt even though no one comes up and says it; hospitals that can adhere to the DRGs will be the hospitals that will not go under."

Other physicians were less certain: "think so," "I have my suspicions," "not directly, but probably." Physicians in the four waivered states -- Maryland, Massachusetts, New Jersey, and New York -- pointed out that technically they were not affected by PPS, but rather by their own states' cost containment systems. (Nevertheless, many of the physicians in waivered states responded affirmatively to the question on the impact of PPS.) Physicians in PPS states remarked that other factors contributed to changes in their practice. Most frequently, the Peer Review Organizations (PROs) were mentioned either as an alternate or additional reason for change. One physician cited a "combination of DRG's and the national drive to reduce health care costs." Another said that "heavy participation in HMO is also a factor."

The time dimension is also illustrated by physicians' random, unsolicited remarks. Two physicians who did not hold PPS responsible for the changes mentioned in Q.40 commented, "not directly but in anticipation" and "not yet but soon."

3.3 PPS Impacts in Waivered and Non-Waivered States

At the time the PPCIS was conducted, hospitals in four states were exempt from Medicare's PPS (Maryland, Massachusetts, New Jersey, and New York). Although Medicare cost control programs were in place in these states, physicians would be expected to differ in their reported changes in inpatient activity resulting from PPS. As shown in Table 3-1, physicians' reports of overall changes in inpatient activity were relatively similar among those in waivered and non-waivered states. For example, 45-46 percent of physicians in the two groups of states were encouraged to reduce tests and x-rays. About 78 percent of those in non-waivered states versus 83 percent in waivered states were urged to discharge sooner. However, the net effect of PPS differed between the two groups of states. As would be expected, physicians in non-waivered states were far more likely to attribute the changes to Medicare's PPS. Presumably, physicians in waivered states attributing the changes to "PPS" were referring to their state-

specific cost control programs. For example, 85 percent of non-RAPs in non-waivered states and only 62 percent in waivered states cited PPS as a reason for one or more changes. Among RAPs, the comparable figures were 90 percent (non-waivered states) and 54 percent (waivered states). As a result the net effect of Medicare's PPS is perhaps best measured by the figures for physicians in non-waivered states rather than "all physicians", due to the downward impact on the estimates from physicians in waivered states. The result is to raise slightly the estimated effect of Medicare's PPS: 68 percent of all physicians in non-waivered states were urged to discharge sooner, versus 64 percent in waivered and non-waivered states combined.

3.4 PPS Impacts by Specialty

Table 3-2 shows the importance, by specialty, of selected changes in inpatient activity. Urologists, cardiologists, internists, and "other surgical specialists" were most likely to be encouraged to discharge sooner, while psychiatrists and pediatricians were least likely to report such pressures. Furthermore, urologists, general surgeons, and cardiologists were most likely to be encouraged to reduce tests and x-rays. Psychiatrists were most often encouraged to admit more patients. Not surprisingly, psychiatrists (and pediatricians, to some extent) were the least likely to be affected by PPS, in part because the hospitals where they tend to admit (i.e., psychiatric hospitals, psychiatric units in general hospitals, and children's hospitals) are generally exempt from PPS, and also because these specialties treat only a small proportion of Medicare patients relative to their entire caseload.

Among RAPs, the percentages of radiologists, anesthesiologists, and pathologists reporting a shift in testing to outpatient settings was almost identical. Radiologists and pathologists were more likely than anesthesiologists to report pressures to reduce expensive diagnostic testing and to conduct fewer procedures.

3.5 Pervasiveness of PPS Impacts

Among RAPs and non-RAPs, a majority of physicians reported multiple changes in inpatient activity over the previous year: 54 percent, non-RAPs; 67 percent, RAPs. (See Table 3-3.) Roughly one-third of the non-RAPs reported a combination of two changes in inpatient activity, while slightly

TABLE 3-2

SELECTED PPS IMPACTS BY SPECIALTY[a]

Specialty	Percent of physicians encouraged to: Discharge sooner	Reduce tests/ x-rays	Admit more patients to hospital	Of those reporting any change, percent citing PPS as reason
All Non-RAPs	78%	45%	22%	79%
General practice	76	49	24	85
Family practice	81	46	20	86
Internal medicine	84	47	17	81
Cardiology	85	56	23	80
Pediatrics	66	39	24	65
Other medical	78	47	19	83
General surgery	81	50	24	82
Orthopedic surgery	74	41	18	86
Ophthalmology	75	40	22	79
Urology	86	54	23	89
Obstetrics/gynecology	80	43	22	75
Other surgical	85	45	24	81
Psychiatry	64	31	29	54
All other specialties	78	47	20	82

Specialty	Percent of physicians encouraged to: Conduct fewer procedures	Reduce expensive diagnostic testing	Test on outpatient basis	Of those reporting any change, percent citing PPS as reason
All RAPs	56%	63%	85%	84%
Radiology	70	65	85	85
Anesthesiology	34	55	86	80
Pathology	67	71	85	88

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[a] This table includes only physicians who (a) had hospital admitting privileges or regularly treated hospitalized patients admitted by other physicians, and (b) who had been affiliated with a hospital for at least one year.

NOTE: The figures in this table have been weighted to provide national estimates.

SOURCE: Physicians' Practice Costs and Income Survey.

less than a third reported only one change. One-fifth cited three or more changes. The RAPs were more likely than the non-RAPs to report multiple changes, and in fact, 44 percent of the RAPs reported that they had been encouraged to change their hospital behavior in all three of the specified ways.

There was a clear relationship between the number of impacts reported and whether PPS was cited as a reason for one or more changes, as shown in Table 3-3. Overall, four-fifths of the physicians reporting one or more changes cited PPS as a reason for the change. The percentages range from 69 percent for non-RAPs reporting only one change to 91 percent for those reporting three or more changes (and from 75 percent to 90 percent for RAPs).

TABLE 3-3

NUMBER OF PPS IMPACTS REPORTED[a]

Number of Impacts	Non-RAPS		RAPs	
	Percent of physicians	Percent citing PPS as reason for change(s)	Percent of physicians	Percent citing PPS as reason for change(s)
Total	100%	79%	100%	84%
0	17	NA	11	NA
1	30	69	22	75
2	34	81	23	81
3 (or more)	20	91	44	90

NA = Not applicable.

[a] This table includes only physicians who (a) had hospital admitting privileges or regularly treated hospitalized patients admitted by other physicians, and (b) who had been affiliated with a hospital for at least one year.

NOTE: The figures in this table have been weighted to provide national estimates.

SOURCE: Physicians' Practice Costs and Income Survey.

4.0 PHYSICIAN CHARACTERISTICS AND PPS IMPACTS

4.1 Introduction

This chapter examines the relationship between selected aspects of a physician's level or type of hospital involvement and reported changes in inpatient activity. Do physicians with implicit financial arrangements (admitting privileges) differ from those with explicit arrangements (such as fee-for-service or salary)? Does the physician's dependency on Medicare or on hospital revenues differentially affect the pressures that hospital administrators place on physicians? Finally, do physicians employed by hospitals, by a clinic, HMO, or other physician, or who are self-employed differ in their responses to PPS?

4.2 Type of Hospital Financial Arrangement

Medicare's PPS is expected to affect physicians differentially, according to their hospital financial arrangement. Each arrangement provides varying incentives according to physicians regarding quantity and mix of inpatient services. Whereas under cost-based reimbursement more services resulted in more revenues to the hospital, under PPS such behavior could result in lower profit or higher loss per case. Thus, under the previous system a physician reimbursed on a fee-for-service or percentage basis would realize personal financial gain from providing more, and more costly, services. Salaried physicians, on the other hand, have no incentive to provide additional services to maximize their income, because their income is fixed.

Given these varying incentives, one would expect hospital administrators to more frequently (and more vigorously) encourage physicians paid on a fee-for-service or percentage basis or with admitting privileges (versus those on salary) to change their hospital behavior as a result of the new PPS incentives. It is not surprising, therefore, that non-RAPs with admitting privileges or paid on a fee-for-service basis or receiving a fixed percent of each charge were more likely to report pressures to discharge sooner or to reduce tests/x-rays than those on straight salary or with another type of arrangement. For example, 81 percent of those paid on a fee-for-service or percentage basis and 79 percent with admitting privileges reported they were encouraged to discharge sooner. (See Table 4-1.) By comparison, 72-74 percent of those paid on a straight salary or by another financial arrangement reported such an impact.

TABLE 4-1

SELECTED PHYSICIAN CHARACTERISTICS AND PPS IMPACTS: NON-RAPS[a]

	Percent of physicians encouraged to:		
	Discharge sooner	Reduce tests/ X-rays	Increase number of patients admitted
Hospital financial arrangement			
Straight salary	72%	42%	19%
Fee-for-service or fixed percent of each charge	81	50	16
Other financial arrangement[b]	74	48	30
No hospital financial arrangement (admitting privileges only)	79	45	22
Percent of patients covered by Medicare			
0-9%	71	41	26
10-49%	82	46	21
50%+	83	49	22
Percent of revenues from hospital patients			
0-9%	71	47	24
10-49%	81	45	23
50%+	78	46	21
Employment setting			
Hospital	70	41	23
Clinic, HMO, or other physician	76	46	18
Self-employed[c]	80	45	22

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[a] Excludes radiologists, anesthesiologists, and pathologists.

[b] Includes salary plus incentives, percent of gross department billings, percent of net department billings, hourly wage, or other arrangement.

[c] Includes physicians who were partners in a partnership, or part-owners in a corporation.

NOTE: The figures in this table have been weighted to provide national estimates.

SOURCE: Physicians' Practice Costs and Income Survey.

Among RAPs, those paid on a fee-for-service or percentage basis were most likely to be encouraged to reduce costly diagnostic testing and to shift testing to an outpatient basis. As shown in Table 4-2, 88 percent of fee-for-service physicians were urged to test on an outpatient basis compared to 78 percent of salaried physicians. RAPs with no hospital financial arrangements constitute a small fraction of all RAPs (2 percent) and were much less likely to be encouraged to conduct fewer procedures (30 percent) and reduce costly diagnostic testing (46 percent).

4.3 Sources of Revenue

Tables 4-1 (non-RAPs) and 4-2 (RAPs) show the relationship between selected PPS impacts and the physicians' reliance on Medicare and hospital revenues. For non-RAPs, physicians with greater dependence on Medicare and hospital revenues were more likely to have been encouraged to discharge sooner. For example, the percent of physicians reporting such an impact ranged from 71 percent for those with less than 10 percent of their patient load covered by Medicare, to 82-83 percent for physicians with 10 percent or more on Medicare. There was also a slight positive relationship between Medicare dependency and pressure to reduce tests and x-rays. In contrast, physicians with less reliance on both hospital and Medicare revenues were slightly more likely to be encouraged to increase admissions. For example, 26 percent of those with small Medicare caseloads (less than 10 percent) were urged to increase admissions compared to 21-22 percent of physicians with larger Medicare caseloads. Psychiatrists and pediatricians are disproportionately represented in the low Medicare caseload group. This may account for the greater emphasis on increasing admissions and less emphasis on discharging sooner, within the low Medicare group.

4.4 Employment Setting

Reported changes in inpatient activity varied somewhat depending on the physician's employment setting. Among the non-RAPs, those who were self-employed were most likely to report pressure to discharge sooner (80 percent), followed by physicians who were employed by a clinic, HMO, or another physician (76 percent) and finally, hospital employees (70 percent). (See Table 4-1.) However, among HMO employees it is probable that other cost control incentives besides PPS account for the pressure to discharge

TABLE 4-2

SELECTED PHYSICIAN CHARACTERISTICS AND PPS IMPACTS: RADIOLOGISTS, ANESTHESIOLOGISTS, AND PATHOLOGISTS

	Percent of physicians encouraged to:		
	Conduct fewer procedures	Reduce costly diagnostic testing	Test on outpatient basis
Type of hospital financial arrangement			
Straight salary	56%	63%	78%
Fee-for-service or fixed percent of each charge	59	65	88
Other financial arrangement[a]	53	55	83
No financial arrangement	30	46	85
Percent of patients covered by Medicare			
0-9%	56	62	75
10-49%	58	63	88
50%+	50	62	85
Percent of revenues from hospital patients			
0-49%	56	57	84
50%+	56	63	86
Employment setting			
Hospital	55	61	80
Clinic, HMO, or another physician	57	65	90
Self-employed[b]	56	62	85

[a] Includes salary plus incentives, percent of gross department billings, percent of net department billings, hourly wage, or other arrangements.

[b] Includes physicians who were partners in a partnership, or part-owners in a corporation.

NOTE: The figures in this table have been weighted to provide national estimates.

SOURCE: Physicians' Practice Costs and Income Survey.

sooner. Compared to hospital employees, non-hospital-based physicians (i.e., the self-employed and those employed by a clinic, HMO, or another physician) more frequently reported being urged to reduce the number of tests and x-rays ordered.

4.5 Volume of Admissions

As shown in Table 4-3, physicians with less than five hospital admissions in the previous two weeks were less often encouraged to discharge sooner than those with five or more admissions (74 percent versus 81-82 percent). Additionally, those with fewer than 10 admissions more frequently reported they were urged to increase the number of patients admitted (23-24 percent versus 19 percent).

Two trends concerning pressures to discharge sooner are evident when the number of admissions is disaggregated by employment setting (Table 4-3). The positive relationship between number of admissions and the percent of physicians encouraged to discharge sooner is found within all three settings. Also, at every admission rate, self-employed physicians were most likely to report such an impact, followed by employees of clinics, HMOs, or another physician; hospital employees were the least likely to be encouraged to discharge sooner.

Among hospital employees, the physicians with 5 to 9 admissions in the previous two weeks were more likely than those with few (0-4) or many (10+) admissions to have been encouraged to reduce tests and x-rays and to increase the number of patients admitted. Among those employed by a clinic, HMO, or another physician, the middle group again was more likely than those with few or many admissions to report pressures to increase the number of patients admitted.

TABLE 4-3

EMPLOYMENT SETTING AND NUMBER OF ADMISSIONS BY PPS IMPACTS: NON-RAPs[a]

	Percent of physicians encouraged to:		
	Discharge sooner	Reduce tests/ X-rays	Increase number of patients admitted
Number of admissions[b]			
0-4	74%	46%	24%
5-9	81	45	23
10+	82	45	19
Employment setting and number of admissions			
Employed by hospital			
0-4	68	36	23
5-9	71	50	28
10+	75	45	24
Employed by clinic, HMO, other physician			
0-4	74	44	18
5-9	76	43	23
10+	79	50	16
Self-employed[c]			
0-4	75	47	25
5-9	82	45	22
10+	83	43	19

[a] Excludes radiologists, anesthesiologists, and pathologists.

[b] Number of admissions refers to number in previous two weeks.

[c] Includes physicians who were partners in a partnership, or part-owners in a corporation.

NOTE: The figures in this table have been weighted to provide national estimates.

SOURCE: Physicians' Practice Costs and Income Survey.

5.0 HOSPITAL CHARACTERISTICS AND PPS IMPACTS

5.1 Introduction

An important goal of PPS is to even out reimbursement or payment differentials associated with regional variations in practice patterns. Tables 5-1 and 5-2 provide baseline data, by Census division, on average length of stay for Medicare and all patients, average expenses per day and per admission, and Medicare admission rates. In Table 5-1 we observe a wide range in average length of stay for all patients, from about 6.3 days in the Pacific states to 8.9 days in Middle Atlantic states, a difference of 2.6 days. Among Medicare admissions the span is even wider, from 8.1 days (Pacific and Mountain) to 12.7 days (Middle Atlantic), a difference of 4.6 days. The high per diem states are in the Pacific, Mountain, South Atlantic, and New England states, while the high cost-per-case states are in the New England, Middle Atlantic and Pacific regions. Finally, the states with the highest Medicare admission rates are in the East South Central, West South Central, and West North Central regions.

We would expect that a hospital's historical position (such as average cost, Medicare dependency, and length of stay) would "predict" the response to PPS. In this chapter, we look at a wide range of hospital-level variables using simple cross-tabulations and means. First, we examine PPS responses according to hospital location (e.g., urban/rural location and region). Next, we describe patterns of PPS impacts by hospital ownership: do hospital responses vary for public, private non-profit, and investor-owned hospitals? We explore whether there might be a "time effect" such that the date the hospital came onto PPS might be related to physicians' reports of PPS impacts. Numerous other hospital characteristics are examined for their relationship to short-run PPS impacts, including teaching status, bed size, occupancy, length of stay, Medicare dependency, average cost, and local hospital competition.

5.2 Hospital Location

Given the wide regional variation shown in Tables 5-1 and 5-2, the impact of PPS on physicians' inpatient activity might be expected to vary depending on hospital location. However, given the PPS payment structure, locational effects may be minimal, at least in the short-run. In the initial phase-in period, the average payment rate was based on a blend of a

TABLE 5-1

SUMMARY DATA ON LENGTH OF STAY AND COSTS BY CENSUS DIVISION[a]

Census Division	Average Stay (days)	Adjusted Expenses	
		Per Admission	Per Day
United States	7.6	$2,789	$369
New England	8.1	3,185	393
Middle Atlantic	8.9	3,090	348
East North Central	7.9	2,974	379
West North Central	8.2	2,622	319
South Atlantic	7.5	2,531	399
East South Central	7.1	2,102	297
West South Central	6.5	2,295	353
Mountain	6.6	2,673	404
Pacific	6.3	3,352	530

[a] For nonfederal, short-term community hospitals.

SOURCE: Americal Hospital Association, Hospital Statistics 1984, (Chicago: AHA, 1984).

TABLE 5-2

SUMMARY DATA ON MEDICARE ADMISSION RATES AND LENGTH OF STAY BY CENSUS DIVISION, FISCAL YEARS 1982-1984[a]

	Medicare Admissions Per 1000 Enrollees			Medicare Average Length of Stay		
Census Division	1982	1984	Percent change 1982-1984	1982	1984	Percent change 1982-1984
United States	392	387	-1.28%	10.3	9.0	-12.72%
New England	353	359	1.70%	11.8	10.3	-12.53
Middle Atlantic	348	355	2.01	13.1	11.9	-8.95
East North Central	389	388	-0.26	10.9	9.1	-16.16
West North Central	446	408	-8.52	9.9	8.3	-16.67
South Atlantic	395	396	0.25	9.9	8.6	-13.58
East South Central	477	470	-1.47	9.3	8.3	-10.90
West South Central	458	447	-2.40	9.0	7.8	-12.40
Mountain	374	354	-5.35	8.5	7.4	-12.62
Pacific	349	340	-2.58	8.5	7.4	-13.02

[a] For short-stay hospitals.

SOURCE: Health Care Financing Administration, Health Care Spending Bulletin, No. 85-02, April 1985.

national rate (25 percent) and a hospital-specific rate (75 percent). In addition, adjustments are made for urban/rural location and region through the area wage index. Thus, it is not too surprising that physician reporting of changes in inpatient activity does not seem to vary by urban/rural location. Almost identical percentages of physicians were encouraged to discharge sooner in urban areas (79 percent) and rural areas (80 percent). (See Table 5-3.) Compared to RAPs in urban areas, those in rural areas were somewhat more often encouraged to conduct fewer procedures (62 percent, rural; 56 percent, urban) as well as to reduce costly diagnostic testing (69 percent versus 62 percent).

Regional variation in PPS impacts was greater than urban/rural differentials. Table 5-3 on non-RAPs shows detail for nine census regions, while Table 5-4 aggregates the states into four regions due to the small cell size for RAPs. (Refer to Appendix A for a listing of states within each region.) Only 71 percent of the physicians in the West South Central region were encouraged to discharge sooner, while 86 percent in Middle Atlantic states were encouraged to do so. As the baseline data in Tables 5-1 and 5-2 show, this emphasis may be related to regional variations in average length of stay (total and Medicare). The West South Central region exhibited a relatively low length of stay while the Middle Atlantic had the highest.

Physicians in New England were most likely to report pressure to reduce tests and x-rays. The baseline data in Table 5-1 again provide insight. Hospitals in New England have the second-highest cost-per-case. One way of reducing the average cost per admission is to reduce ancillary intensity.

RAPs in Western states most often reported pressures to reduce diagnostic testing (68 percent), while those in the North Central states most often were encouraged to conduct tests on an outpatient basis (88 percent). These two findings are again consistent with the baseline data in Tables 5-1 and 5-2. Hospitals in the West (particularly Pacific states) have high per diem costs and would be likely to encourage RAPs to reduce costly diagnostic testing. In the North Central region, Medicare admission rates are higher than average. Shifts toward testing in outpatient settings may be recommended by the Medicare Peer Review Organizations (PROs).

Estimates for the Northeast are dominated by physicians in waivered states. When such physicians are excluded, the percentages for non-RAPs do

TABLE 5-3

HOSPITAL LOCATION[a] AND PPS IMPACTS, NON-RAPs[b]

	Percent of physicians encouraged to:		
	Discharge sooner	Reduce tests/ x-rays	Increase number of patients admitted
Location			
Urban	79%	45%	22%
Rural	80	44	19
Region			
New England	84	51	17
Middle Atlantic	86	46	27
South Atlantic	77	45	19
East South Central	77	41	15
West South Central	71	43	20
East North Central	82	44	22
West North Central	75	43	19
Mountain	81	48	29
Pacific	75	43	20
Northeast	85	48	24
Urban	85	48	25
Rural	88	44	20
(Non-waiver only)[c]	(87)	(51)	(24)
South	76	44	19
Urban	75	45	19
Rural	76	40	18
North Central	80	44	21
Urban	79	43	22
Rural	85	47	15
West	76	44	22
Urban	77	44	21
Rural	75	46	28

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[a] Refer to Appendix A for a list of states within each region.

[b] Excludes radiologists, anesthesiologists, and pathologists.

[c] Excludes physicians in waivered states (Massachusetts, New Jersey, New York).

SOURCES: Physicians' Practice Costs and Income Survey; CHER Hospital Data Tape.

TABLE 5-4

HOSPITAL LOCATION[a] AND PPS IMPACTS: RADIOLOGISTS, ANESTHESIOLOGISTS, AND PATHOLOGISTS

	Percent of physicians encouraged to:		
	Conduct fewer procedures	Reduce costly diagnostic testing	Test on outpatient basis
Location			
Urban	56%	62%	85%
Rural	62	69	84
Northeast	53	61	83
Urban	52	59	83
Rural*	59	76	85
(Non-waiver only)[b]	(68)	(65)	(90)
South	57	62	84
Urban	55	59	84
Rural	67	74	85
North Central	58	62	88
Urban	58	62	88
Rural*	61	64	87
West	57	68	84
Urban	57	69	85
Rural*	54	62	79

[a] Refer to Appendix A for a list of states within each region.

[b] Excludes physicians in waivered states (Massachusetts, New Jersey, New York).

*These percentages are based on fewer than 30 cases.

SOURCES: Physicians' Practice Costs and Income Survey; CHER Hospital Data Tape.

not change substantially (figures in parentheses in Table 5-3). However, the percentages for RAPs rise sharply so that those in the Northeast are more likely than others to report being pressured to conduct fewer procedures (68 percent), reduce costly diagnostic procedures (65 percent), and test on an outpatient basis (90 percent) (figures in parentheses in Table 5-4).

In general, the data in Tables 5-3 and 5-4 suggest that relatively little within-region urban/rural differences exist in the percent of physicians encouraged to change their inpatient practices. In part, this is due to the "sheltering" inherent in Medicare's PPS. (The urban/rural comparisons for RAPs are likely to be unreliable due to the small number of cases in rural areas.)

5.3 Hospital Ownership

Tables 5-5 and 5-6 show rather striking similarities for the most part in physicians' reporting of changes in inpatient activity, with respect to hospital ownership. One notable difference in Table 5-5 is the percent of physicians encouraged to increase the number of patients admitted. While about 20 percent of physicians in public and private nonprofit hospitals reported such an impact, 29 percent of those in investor-owned hospitals reported they were urged to increase admissions. In contrast, physicians in investor-owned hospitals were least likely to be encouraged to reduce tests or x-rays. A partial explanation for these differences may be in the interactions among hospital location, ownership, and PPS impacts. Physicians in investor-owned hospitals are concentrated in the South (over 60 percent), particularly the South Atlantic and West South Central areas. These areas have relatively low costs per day and per admission. Thus, reducing ancillary intensity may not be a priority. On the other hand, the Medicare admission rate in these areas is above the national average. Investor-owned hospitals may be encouraging physicians to increase the number of Medicare and non-Medicare patients admitted to maintain their occupancy rate and their profits in the face of declining numbers of cost-based days of care.

While it might have been expected that physicians in investor-owned hospitals would be much more likely to report pressures to reduce costs (e.g., by discharging sooner, conducting fewer procedures, or shifting

TABLE 5-5

HOSPITAL OWNERSHIP, AFFILIATIONS, AND PPS IMPACTS, NON-RAPs[a]

	Percent of physicians encouraged to:		
	Discharge sooner	Reduce tests/ x-rays	Increase number of patients admitted
Hospital Ownership			
Public	77%	45%	19%
Private, not-for-profit	79	46	21
Investor-owned	73	37	29
Date Hospital Came Onto PPS[b]			
October-December 1983	76	45	14
January-March 1984	78	44	20
April-June 1984	78	45	25
July-September 1984	79	45	23
Teaching Facility[c]			
Yes	79	48	22
No	79	43	21
COTH Membership			
Yes	79	50	26
No	78	44	20
JCAH Accreditation			
Yes	78	45	21
No	74	44	31

COTH = Council on Teaching Hospitals
JCAH = Joint Council on the Accreditation of Hospitals

[a] Excluding radiologists, anesthesiologists, and pathologists.

[b] Excludes hospitals in waivered states: Maryland, Massachusetts, New Jersey and New York.

[c] Teaching facility defined by ratio of residents per 100 beds greater than zero.

SOURCES: Physicians' Practice Costs and Income Survey; 1982 AHA Survey of Hospitals.

TABLE 5-6

HOSPITAL OWNERSHIP, AFFILIATIONS, AND PPS IMPACTS: RADIOLOGISTS, ANESTHESIOLOGISTS, AND PATHOLOGISTS

	Percent of physicians encouraged to:		
	Conduct fewer procedures	Reduce costly diagnostic testing	Test on outpatient basis
Hospital Ownership			
Public	60%	71%	89%
Private, not-for-profit	55	60	85
Investor-owned	54	73	91
Date Hospital Came Onto PPS[a]			
October-December 1983	58	64	84
January-March 1984	55	68	82
April-June 1984	60	60	84
July-September 1984	60	63	90
Teaching Facility[b]			
Yes	54	60	84
No	57	65	87
COTH Membership			
Yes	50	57	83
No	57	64	86

COTH = Council on Teaching Hospitals

[a] Excludes hospitals in waivered states: Maryland, Massachusetts, New Jersey, and New York.

[b] Teaching facility defined by ratio of residents per 100 beds greater than zero.

SOURCES: Physicians' Practice Costs and Income Survey; 1982 AHA Survey of Hospitals.

testing to an outpatient setting), it should not be surprising that physicians in public and private, nonprofit hospitals generally reported such changes at a similar rate. Before PPS, the not-for-profit hospital sector had, on average, higher costs per day and per admission than the investor-owned hospital sector, and as a result would be more likely to begin encouraging physicians to respond to PPS incentives and reduce costs in various ways. The investor-owned hospitals, with already lower costs may be encouraging physicians to continue their cost consciousness.

5.4 Date Hospital Came Onto PPS

Hospitals came onto PPS at the anniversary of their cost reporting periods beginning on or after October 1, 1983. The expected relationship between the hospital's starting date under PPS and the nature or magnitude of changes in inpatient activity is ambiguous. Some impacts may be felt immediately; others may be longer term. As shown in Tables 5-5 and 5-6, the date the hospital came onto PPS has no clear association with physicians' reporting of perceived pressures to change in inpatient activity. There is a slight trend for a higher percent of physicians to report pressures to increase admissions in the hospitals that came onto PPS in the last two quarters of fiscal 1984. Among RAPs, pressures to shift testing to outpatient departments were reportedly greatest within hospitals coming onto PPS in the last quarter.

5.5 Hospital Affiliations

Teaching hospitals traditionally provide more procedure-intensive inpatient care. We might expect, therefore, greater pressures exerted on physicians affiliated with teaching hospitals, particularly in reducing ancillary intensity. This general trend holds for non-RAPS but not for RAPS. Among non-RAPS, 48 percent in teaching hospitals were urged to reduce tests or x-rays, compared to 43 percent in non-teaching hospitals (Table 5-5). In contrast, 65 percent of the RAPs in teaching hospitals were urged to reduce costly diagnostic testing versus 65 percent in other hospitals (Table 5-6).

Furthermore, hospital membership in the Council on Teaching Hospitals (COTH) was associated with more frequent reports by non-RAPs of pressure to

reduce tests and x-rays and to increase the number of patients admitted. RAPs in COTH-member hospitals were less likely to report changes in inpatient activity.

Physicians in hospitals accredited by the Joint Commission on the Accreditation of Hospitals (JCAH) were much less likely than nonaccredited hospitals to report pressures to increase admissions (21 and 31 percent, respectively) and somewhat more likely to have been encouraged to discharge sooner (78 and 74 percent). (Most RAPs were affiliated with JCAH-accredited hospitals, so no comparisons on this variable are possible for RAPs.) These differences between accredited and non-accredited hospitals remain even when investor-owned hospitals are excluded. It is not clear what "intervening variable" accounts for the differences according to accreditation status.

Tables 5-7 and 5-8 show the relationship between the level of teaching activity in teaching facilities and reported changes in inpatient activity. (Teaching involvement is measured by the number of residents per 100 beds). Among RAPs, teaching hospitals with more teaching involvement were less likely to urge physicians to conduct fewer procedures and to test on an outpatient basis and were more likely to urge physicians to increase the number of patients admitted. Larger teaching hospitals were also more likely to encourage shorter stays.

5.6 Bed Size, Occupancy, and Length of Stay

Tables 5-7 and 5-8 display the nature of PPS responses according to average bed size of the hospital with which the physician is primarily affiliated. Among non-RAPs, for example, those who were encouraged to discharge sooner were associated with hospitals having an average of 370 beds, while those not reporting such pressure were in slightly larger hospitals (378 beds). In general, physicians in smaller hospitals were more likely to report pressure to change inpatient activity. In particular, RAPs who were encouraged to shift testing to an outpatient setting were in considerably smaller hospitals on average (366 versus 393 beds).*

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*The average hospital bed size reported here is larger than the national average (176 in 1983) for two reasons. First, physicians affiliated with larger hospitals would have a higher probability of selection because more physicians are associated with larger hospitals. Second, physicians reporting the hospital with which they are primarily affiliated would tend to report the largest hospital, even though they may have admitting privileges to smaller hospitals.

TABLE 5-7

SELECTED HOSPITAL CHARACTERISTICS AND PPS IMPACTS, NON-RAPS[a,b]

	PPS Impacts					
	Discharge sooner		Reduce tests/X-rays		Increase number of patients admitted	
	Yes	No	Yes	No	Yes	No
Residents per 100 beds	14.2	13.8	14.4	13.7	17.1	13.4
Average number of beds per hospital	370	378	373	371	360	375
Occupancy rate (average)	78%	77%	78%	77%	76%	78%
Average Medicare length of stay	11.1	11.5	11.2	11.2	11.5	11.1
Medicare dependency of hospital						
Medicare admissions as percent of total (average)	30.5%	28.6%	30.6%	29.7%	30.2%	30.0%
Medicare days as percent of total (average)	42.0	38.9	41.9	40.8	41.2	41.3
Average cost of inpatient care						
Average cost per Medicare admission	$2,933	$2,886	$2,971	$2,886	$3,129	$2,868
Average cost per Medicare day	279	287	283	279	292	278
Local hospital competition (Average number of beds per 10,000 population)	66.9	70.7	68.3	67.3	67.6	68.0

---

[a] Excludes radiologists, anesthesiologists, and pathologists.

[b] Specifically, physicians were asked, "Since this time last year, have the physicians in your hospital been encouraged to...."

SOURCES: Physicians' Practice Costs and Income Survey; 1982 AHA Survey of Hospitals; CHER Hospital Data Tape; and Area Resource File.

TABLE 5-8

SELECTED HOSPITAL CHARACTERISTICS AND PPS IMPACTS: RADIOLOGISTS, ANESTHESIOLOGISTS, AND PATHOLOGISTS[a]

	PPS Impacts					
	Conduct Fewer Procedures		Reduce Costly Diagnostic Testing		Test on Outpatient Basis	
	Yes	No	Yes	No	Yes	No
Residents per 100 beds[b]	11.7	14.8	12.7	13.7	12.7	15.4
Average number of beds per hospital	359	387	360	385	366	393
Occupancy rate (average)	77%	78%	77%	79%	78%	79%
Average Medicare length of stay	10.6	11.2	10.7	11.2	10.8	10.7
Medicare dependency of hospital						
Medicare admissions as percent of total (average)	31.5	30.3	31.8	29.8	31.4	29.4
Medicare days as percent of total (average)	42.8	41.2	43.0	41.0	42.7	40.0
Average cost of inpatient care						
Average cost per Medicare admission	$2,884	$2,998	$2,948	$2,937	$2,902	$3,198
Average cost per Medicare day	281	288	286	283	283	296
Local hospital competition (Average number of beds per 10,000 population)	71.4	64.9	70.0	65.0	68.4	68.1

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[a] Specifically, physicians were asked, "Since this time last year, have the physicians in your hospital been encouraged to...."

[b] Includes only those hospitals with any teaching activity.

SOURCES: Physicians' Practice Costs and Income Survey; 1982 AHA Survey of Hospitals; CHER Hospital Data Tape; and Area Resource File.

The hospital occupancy rate was roughly comparable for physicians reporting changes in inpatient activity and those not reporting a change. The occupancy rate averaged around 77-78 percent. We would have expected hospitals that encouraged physicians to increase admissions to have lower occupancy rates although this was not the case.

The average Medicare length of stay was not associated with any of the perceived PPS impacts. This null finding was especially surprising in light of the expected PPS incentives toward shorter stays, as well as the regional variations in length of stay displayed in Tables 5-1 and 5-2. This lack of effect remained when holding region constant.

5.7 Medicare Dependency of Hospital

Physicians in hospitals that are more dependent on Medicare revenues (as measured by percent of total days/admissions) would be expected to report more encouragement to change their inpatient activity. No measurable difference was found, however. Medicare admissions averaged about 30 percent of total admissions and Medicare days represented about 40 percent of total days.

5.8 Average Cost of Inpatient Care

We would expect hospitals with higher average costs per admission to more often encourage physicians to reduce costs by discharging sooner, conducting fewer procedures, etc. This was borne out by the data in Table 5-7. For example, physicians who were encouraged to discharge sooner were in slightly higher cost hospitals ($2,933) than those not reporting such an impact ($2,886). Similarly, physicians (non-RAPs) who were urged to order fewer tests or x-rays were in hospitals with slightly higher costs ($85) per Medicare admission. Reducing ancillaries is one clear way of cutting the cost of a hospital stay. Finally, physicians in hospitals with higher costs per Medicare admission were more likely to be urged to increase the number of patients admitted.

The average cost per Medicare admission was not as important in "explaining" PPS responses among RAPs. There were virtually no differences in average costs in hospitals where physicians were or were not urged to conduct fewer procedures or reduce costly diagnostic testing. An unexpected

finding was that physicians who were encouraged to test on an outpatient basis were in lower cost hospitals ($2,902) than those not urged to make such a shift ($3,198).

5.9 Local Hospital Competition

The expected relationship between local hospital competition and PPS impacts is not entirely clear. We might expect hospitals in highly competitive areas to encourage physicians to increase the number of admissions. Such hospitals might be high cost/low utilization hospitals with pressures to fill unused capacity in order to cover their fixed costs. As can be seen from Tables 5-7 and 5-8, no meaningful relationships were found between the number of hospital beds per capita and perceived PPS impacts.

Because the PPS payment schedule shelters hospitals from some of the effects of competition (e.g., special treatment of sole community hospitals, rural referral centers), such results may not be too surprising. Confounding variables may also explain a lack of competitive effects on the likelihood to encourage admissions and/or lower costs.

APPENDIX A

DEFINITION OF REGIONS

NORTHEAST

New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut

Middle Atlantic: New York, New Jersey, Pennsylvania

SOUTH

South Atlantic: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida

East South Central: Kentucky, Tennessee, Alabama, Mississippi

West South Central: Arkansas, Louisiana, Oklahoma, Texas

NORTH CENTRAL

East North Central: Ohio, Indiana, Illinois, Michigan, Wisconsin

West North Central: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas

WEST

Mountain: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada

Pacific: Washington, Oregon, California, Alaska, Hawaii

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